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General and complete disarmament

Effects of the use of armaments and ammunitions containing depleted uranium

Report of the Secretary-General

Summary

The present report contains views of Member States and relevant international organizations on the effects of the use of armaments and ammunitions containing depleted uranium. The Secretary-General has, to date, received 10 reports from Governments, in addition to a response from the International Atomic Energy Agency.

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I. Introduction

1. The General Assembly, in paragraph 2 of its resolution 71/70, invited Member States and relevant international organizations, particularly those that had not yet done so, to communicate to the Secretary-General their views on the effects of the use of armaments and ammunitions containing depleted uranium, and requested the Secretary-General to submit a report on that subject to the Assembly at its seventy-third session.

2. On 2 February 2018, a note verbale was sent to Member States requesting them to submit their reports by 15 May 2018. The Office for Disarmament Affairs also submitted a similar request to the International Atomic Energy Agency (IAEA), the United Nations Environment Programme (UNEP) and the World Health Organization (WHO). To date, the Secretary-General has received 10 replies from Governments, in addition to a response from IAEA. Any views received after 15 May 2018 will be posted on the website of the Office for Disarmament Affairs in the original language received. No addenda will be issued.

II. Replies received from Governments

Brunei Darussalam

[Original: English]
[14 May 2018]

Brunei Darussalam acknowledges that the effects of the use of armaments and ammunitions containing depleted uranium may cause health and environmental concerns. Although the country is not directly affected, the concern is still shared with those countries which may be affected, especially countries in the region.

Brunei Darussalam does not possess any armaments or ammunitions containing depleted uranium, be it from newly acquired military equipment or from its obsolete armaments and ammunitions, or stockpiles thereof.

The country has put in place measures to mitigate the effects of depleted uranium that are similar to those resulting from exposure to any other dangerous radioactive substance. The country is also open to cooperation with other international organizations, such as WHO and IAEA, if depleted uranium is found in the country.

Cuba

[Original: Spanish]
[15 May 2018]

Cuba shares the legitimate concern of the international community regarding the effects on human health and the environment of the use of armaments and ammunitions containing depleted uranium.

It is ironic that there is no restriction on the use of depleted uranium in the military sector, especially when it is used for offensive purposes to strengthen projectiles, bombs and missiles, although there are legally binding standards to regulate the use of nuclear material, including depleted uranium, for peaceful purposes.

The data provided by countries affected by radioactive residues arising from the use of depleted uranium in armed conflict show that it can cause serious harm to human, plant and animal life and to the environment in general. That confirms the

need for further research to assess the health risks and environmental impact in the long term.

In order to facilitate the assessment, administration and clearance of contaminated areas, it is vital that Member States that have used armaments and ammunition containing depleted uranium provide detailed information to the competent authorities of the countries concerned regarding the location of the areas of use and the amounts used.

The recommendations of the International Atomic Energy Agency, the World Health Organization and the United Nations Environment Programme concerning mitigation of both confirmed and potential hazards from contamination resulting from the use of depleted uranium should be implemented by all those involved.

In strict compliance with the principles of international law, including international humanitarian law, Cuba supports the prohibition on the use of weapons, projectiles and materials that may cause superfluous injury or unnecessary suffering. Moreover, it should be recalled that the use of methods of warfare that are intended to cause widespread, long-term and severe damage to the natural environment is prohibited.

We call on all States to comply with article 51 of the Protocol additional to the Geneva Conventions of 12 August 1949, and relating to the protection of victims of international armed conflicts.

Jordan

[Original: Arabic]
[10 May 2018]

Jordan is one of the States that leads the way in promoting peace and security in the region and the world. It is well known for its moderate policies and love of peace, and it constantly strives to spare the people of the region from the scourge of war and destruction. Accordingly, the Government of Jordan always reminds the international community of how important it is to resolve disputes by peaceful means; strengthen confidence and transparency at all levels among the people of a single country, the States of the region, in particular, and the States of the world, in general; support disarmament; and limit the use of violence and arms to resolve disputes. Failing to do so will create a climate of mistrust and start an arms race among the States of the region, which, in turn, would give rise to future wars and armed conflicts that will bring woe and devastating consequences to the belligerents and destabilize the States of the region.

Depleted uranium is used in many civilian and military applications, such as manufacturing anti-armour projectiles and plating and armour for tanks and combat vehicles, because it is highly effective at penetrating thick concrete and strong armour, and at dissolving solid substances. It is the material of choice in such applications thanks to its high density, which is approximately twice that of lead. However, the long-term effects that depleted uranium has on human beings and the environment has resulted in heightened interest on the part States and international and humanitarian organizations in studying its impact and its long-term effects on health and the environment.

Depleted uranium is considered to be a toxic substance from both a chemical and radiological perspective. Although it is referred to as "depleted" uranium, it retains 60 per cent of the radioactivity of natural uranium. Exposure to depleted uranium therefore has grave consequences and results in considerable harm, because it releases a tremendous amount of energy that melts everything with which it comes into contact.

This energy can penetrate both heavy armour and very thick concrete surfaces, and it can cause enormous fires with temperatures reaching thousands of degrees Celsius that can destroy all life in the area where the depleted uranium was used.

In addition, a large amount of radiation is released by the nuclear reaction and explosion, polluting soil, trees, plants, weapons and equipment. Its deleterious effects on human beings are such as to cause blood and lung cancer, leukaemia, bone cancer and severe kidney damage. Meanwhile, the resulting radioactive dust can disperse over an area the radius of which extends more than 100 km from the epicentre of the explosion.

Creating a clean and secure environment that is safe from the risk posed by these weapons is the aim of the many States that are striving to bring prosperity and peace to their peoples, and employ technology in the service of humanity, peace, security and development. They seek to avoid war and its negative effects on human beings and the environment, including such problems as incurable diseases, polluted groundwater and vegetation, land that cannot support agriculture and the prohibitive cost of clearing and removing remnants, particularly when weaponry containing depleted uranium has been used.

Managing radioactive waste is no less important than addressing the effects that arise from the use of depleted uranium. One must be mindful of the danger posed by the careless disposal of radioactive waste and the resulting long-term contamination of agricultural land and groundwater, which has an adverse effect on human health and pollutes the environment.

Accordingly, Jordan encourages and supports the resolution of conflicts through peaceful solutions, patience and non-violence, in view of the impact and consequences that the use of such weapons can have on human beings and the environment. It encourages States to comply with Security Council resolutions regarding non-proliferation of nuclear weapons and weapons of mass destruction, and the use of force against civilians. The most significant of those is resolution 1540 (2004), which is the basis for curbing the proliferation of weapons of mass destruction at the international level. Jordan urges the international community to pursue a policy aimed at building confidence and encouraging cooperation among the States of the region, enhancing stability, peace and security in the region and at the national, regional and international levels, and promoting and strengthening the principles of equality and freedom.

In view of the foregoing and General Assembly resolution 71/70, which was adopted on 5 December 2016, Jordan would like to make the following recommendations:

- The international community must consider the risks to human beings and the environment associated with the use of depleted uranium as a weapon and to think carefully before using such weapons.
- Jordan urges States that have used armaments and ammunitions containing depleted uranium in armed conflict to inform the relevant authorities of the affected States and, upon request, provide them with information on the areas where such weapons were used, in order to enable them to survey and decontaminate those areas.
- Jordan encourages affected States to conduct studies and research on the effects of such armaments and ammunitions on the environment and human beings.
- Relevant personnel must be better informed about this type of ammunition.
- Stockpiles of such ammunition must be isolated from other munitions and stored in ideal conditions. They must be subject to security controls and storage locations must be inspected regularly.

Madagascar

[Original: French]
[15 May 2018]

The United Nations reminds Member States of the risks to human health and the environment of using weapons and ammunitions containing depleted uranium. Madagascar does not possess nuclear weapons and has ratified the Treaty on the Prohibition of Nuclear Weapons (20 September 2017) and the Treaty on the Non-Proliferation of Nuclear Weapons. (8 October 1970).

Mexico

[Original: Spanish]
[15 May 2018]

This information is provided as a supplement to the views submitted by Mexico on previous occasions, most recently in 2016 on the margins of the seventy-first session of the General Assembly.

As a responsible actor on the international stage, Mexico is committed to global actions designed to enhance nuclear safety in order to avert the humanitarian impact of weapons with indiscriminate effects.

That is why Mexico believes that the use of depleted uranium should be limited to peaceful purposes, such as industrial, health and research activities and the production of electric power, thereby avoiding any association of the use of radioactive material with proliferation issues.

Mexico therefore complies with international measures to ensure that nuclear material in its territory is safe, in accordance with the recommendations of the International Atomic Energy Agency.

The National Nuclear Safety and Safeguards Commission is the entity responsible in Mexico for regulating, strictly controlling and authorizing exports and imports of depleted uranium, which is used solely for peaceful purposes. In that regard, there is no record of the use of depleted uranium in armaments or ammunitions in Mexico.

The Commission is not aware of any research conducted in Mexico on the effects of the use of armaments and ammunitions containing depleted uranium.

Netherlands

[Original: English]
[15 May 2018]

The Netherlands voted in favour of General Assembly resolution 71/70, in which the Assembly invited Member States and relevant international organizations to communicate to the Secretary-General their views on the effects of the use of armaments and ammunitions containing depleted uranium.

The Netherlands recognizes the need for additional research on the effects of the use of armaments and ammunitions containing depleted uranium and appreciates that this issue is being discussed in the forum of the United Nations. However, the resolution's reference to the "potential" harmful effects of the use of armaments and ammunitions containing depleted uranium on human health and the environment cannot thus far be substantiated by scientific studies conducted by relevant international organizations such as WHO. The most important aspect emerging from

the scientific literature of the past 20 years is the complete disagreement among the different studies carried out on depleted uranium, which are characterized by strongly contrasting results.

The Dutch armed forces do not use munitions containing depleted uranium. In the context of multinational missions, however, it is not impossible that Dutch service personnel might operate in areas in which munitions containing depleted uranium are being or have been used by allies. The health and well-being of Dutch soldiers deployed on international missions is under the continuous scrutiny of the Dutch Government. Exposure to hazardous materials must be avoided to the greatest possible extent.

Oman

[Original: Arabic]
[16 April 2018]

Annex A
Effects of the use of armaments and ammunitions containing depleted uranium

- Depleted uranium that is used in armaments and ammunitions is a by-product of the production of enriched uranium for use as fuel in nuclear reactors and in the manufacture of nuclear weapons. The policy of Oman in that regard is very clear. It has always maintained that the total elimination of nuclear weapons is the only absolute guarantee against their use or threat of use in any way.

- There is no depleted uranium to be found in Oman because the country does not have any nuclear reactors where uranium can be enriched. It does not use any type of nuclear fuel or energy, even for peaceful industrial purposes, nor does it possess any weapons that may contain this substance. Moreover, the accession of Oman to the Treaty on the Non-Proliferation of Nuclear Weapons serves to reaffirm its clear policy in that regard. As a consequence, no effects from the use of this substance have been reported in Oman.

Peru

[Original: Spanish]
[15 May 2018]

As human beings have become more aware of the urgent need to take all appropriate measures to protect life and the environment, depleted uranium should be used only in the most extreme cases, since the real long-term consequences of exposure to this metal on the health of living beings and the impacts on the environment have not yet been confirmed.

The Armed Forces of Peru do not use or plan to use armaments or ammunitions containing depleted uranium, as they are aware of the extent of the impact caused in territories where residues containing this component have seriously affected human beings and the environment.

Qatar

[Original: Arabic]
[2 April 2018]

Report on the effects of the use of armaments and ammunitions containing depleted uranium

Depleted uranium projectiles are a new generation of weapons that have come into use recently. A depleted uranium projectile produces a large quantity of radioactive dust when it strikes its target, and this dust, in turn, rises on the column of hot air that is produced by the heat of the explosion.

Natural uranium consists of three isotopes, U-238, U-234 and U-235, that make up 99.28 per cent, 0.71 per cent and 0.0058 per cent, respectively, of the uranium found in nature. Uranium is enriched through a complex process in order to increase the proportion of U-235 from 0.71 per cent to more than 90 per cent. Enriched uranium is used as fuel for nuclear reactors and in the manufacture of fission nuclear bombs. A by-product of the enrichment process, depleted uranium owes its name to its low concentration of U-235, which declines from 0.71 per cent to 0.2–0.3 per cent, and its high concentration of U-238, which increases from 99.28 per cent to 99.7 per cent.

Depleted uranium is used to manufacture anti-armour projectiles because it is very dense (19,000 kg/m^3), a characteristic that enables it to penetrate armour, and inexpensive. Although it has only 60 per cent of the radioactivity of natural uranium, depleted uranium is a major threat to living organisms because it emits high-energy alpha and gamma rays, which are harmful to health.

Statistics indicate that the environment and human beings have been affected by the use of depleted uranium projectiles in military operations in Kosovo, Bosnia and Herzegovina, Serbia, Montenegro, Kuwait and Iraq. Such projectiles caused radiological contamination of the environment (water, air and soil) and polluted the groundwater, and that, in turn, had an adverse effect on the environment and humans.

Depleted uranium has biological effects. It emits nuclear radiation that consists mainly of alpha and gamma rays. The atoms and molecules of living cells that are exposed to that radiation are ionized and therefore undergo physical changes. Those ionized atoms and molecules are subsequently involved in chemical reactions and thus cause chemical changes to certain cell components and living tissue, which, in turn, change the biological functions of cells, tissue and organs. The tissues found in bone marrow, brain cells and the digestive system are among the most sensitive to radiation. Moreover, the genes responsible for transferring hereditary information are highly susceptible to radiation, and that may lead to genetic mutations and birth defects. Owing to the cumulative effect of exposure to radiation, the change in the biological functioning of cells and tissues, and any subsequent signs of illness, may become apparent within hours of exposure or after many years.

It has been established that introducing depleted uranium into the human body causes generalized health problems. Depleted uranium causes various illnesses, including cancer; cardiovascular, respiratory and digestive diseases; neurological and mental disorders; and deterioration of the immune system. Because of its damaging effect on chromosomes, it can alter genes and thereby cause birth defects.

The depleted uranium found in such projectiles can enter the human body by ingestion of contaminated food and water or inhalation of contaminated air. Once inside the body, it affects the internal organs, such as the lungs and the intestinal mucosa. As with other heavy metals, such as mercury or lead, uranium becomes toxic

when it is dissolved. That is to say, when a sufficient quantity is dissolved in the bloodstream it can damage the body's tissues, particularly the kidneys, and cause health problems. Nearly 90 per cent of uranium that has been dissolved in bodily fluids is eliminated from the body within 48 hours through urination. However, the 10 per cent that remains may lead to long-term health problems, such as chronic renal injury, which is the most prevalent type injury, particularly given that the half-life of uranium is 4.5 billion years.

Depleted uranium projectiles cause environmental pollution. When inhaled, the pollutants that were released can cause disease. The radioactive contamination resulting from the use of depleted uranium projectiles against civilians has serious consequences for public health because it damages the human immune system. Doctors have observed that the number of children stricken by cancer, in particular leukaemia, has risen rapidly. They have also discovered that there is a relationship between radioactive remnants (radioactive bullets) and increased prevalence of cancer.

The damage to health caused by chemical poisoning with heavy metals, such as uranium, is severe, as those metals can reach the liver and kidneys through the bloodstream. Chronic uranium poisoning causes immune deficiency and cancer, in particular leukaemia. Depleted uranium can have hereditary effects. It may lead to an increase in abortions and intrauterine fetal deaths, and it can cause defects in the digestive system and other organs of the fetus, which is often unable survive. Depleted uranium can also cause abnormal childbirth. Children who survive are born with congenital anomalies that are caused by depleted uranium, and the genes of mothers and those of their children sustain damage that lasts for many years.

It has become imperative to ban the use of armaments and ammunitions containing depleted uranium. States that use armaments and ammunitions containing depleted uranium must compensate the States that they attack with such weapons for the environmental and health damage caused. Moreover, States that use armaments and ammunitions containing depleted uranium have a legal and moral responsibility towards the human victims and are therefore responsible for cleaning up the pollution that they caused.

We recommend continued research into this subject and comprehensive periodic monitoring of areas contaminated by radioactive materials, which remain active for thousands of years. We call upon international organizations to provide the advanced equipment and devices that are needed to address pollution and reverse its effects.

These weapons, which cause unjustifiable and intense suffering and pain for non-combatants, and severe, widespread and long-term environmental harm, must be banned by a protocol supplementary to the Convention on Certain Conventional Weapons. The international community must make a concerted effort to survey the areas that were affected by the use of depleted uranium projectiles in operational theatres and the environment in Kosovo, Bosnia and Herzegovina, Serbia, Montenegro, Kuwait and Iraq. The levels of contamination must be determined and appropriate recommendations made to protect the environment and human beings in those areas.

Making facts and data available in all international forums on the tragedies that have been caused by the use of depleted uranium is one of the goals of the international effort to put in place a mechanism and guarantees to prevent depleted uranium from being used against any of the peoples of the world.

Ukraine

[Original: English]
[15 May 2018]

Weapons and ammunition containing depleted uranium have not been used in Ukraine.

At the same time, low-enriched nuclear fuel (containing less than 20 per cent uranium-235) is used only in the research nuclear reactor of the Institute for Nuclear Research of the National Academy of Sciences of Ukraine. Its application is also provided for at the Neutron Source Facility at the National Science Centre's Kharkiv Institute of Physics and Technology, which is not yet fully operational, however. The handling of this fuel is consistent with national legislation, as well as international requirements, including those of IAEA.

III. Replies received from agencies and organs of the United Nations system

International Atomic Energy Agency (IAEA)

[Original: English]
[14 May 2018]

IAEA has not been involved in any additional assessments after those resulting in the 2010 publication related to the situation in southern Iraq. This is due to the absence of requests from Member States.

The general conclusion outlined in those publications and in other studies in which IAEA participated (for instance, those related to post-conflict situations in the Balkan region) is that the existence of post-conflict depleted uranium residues dispersed in the environment, when observed as confined contamination of soils, vegetables, water and surfaces, does not pose a radiological hazard to the local population. The estimated annual exposures that could arise in the regions where dispersed residues exist would be of the order of a few microsieverts, i.e. well below the annual dose received by the population worldwide due to naturally occurring sources of radiation, and far below the reference level recommended by IAEA as a radiological criterion for considering the necessity for remedial action.

However, all the aforementioned studies stressed that the presence of large fragments of, or complete, depleted uranium ammunition could result in exposures of radiological significance to individuals who are in direct contact with those radioactive materials, for example, if they are collected as souvenirs or when military vehicles that have been hit by such ammunition are reprocessed for scrap metal. The advice in such cases was to identify and restrict access to the locations where such fragments of or complete munitions could be found, which normally are the areas where affected war equipment remains after a conflict has ended and, subsequently, for the national authorities to conduct survey campaigns and for the depleted uranium ammunition residues to be managed as low-level radioactive waste.

IAEA provided the results of the studies, including recommendations, to the national authorities in the affected regions that have the competence to carry out further surveys and monitoring activities, where applicable. IAEA stated that the studies dealt exclusively with civilian inhabitants in post-conflict environments and that the results and conclusions were valid at the time that the assessments were carried out.

In summary, in the studies in which IAEA was involved, the resulting radiological risk to the public and the environment was not significant in situations where depleted uranium is observed in the form of localized contamination of the environment by small particles resulting from the impacts. However, in situations where fragments of, or complete, depleted uranium ammunitions were found, there is a potential risk of radiation effects for individuals who come into direct contact with such fragments or ammunitions. This risk can be mitigated by the national authorities conducting such simple countermeasures as the collection, storage and disposal of such fragments.

Nevertheless, it was also observed that, in a post-conflict environment, the presence of depleted uranium residues further increases the anxiety of local populations, and that the results of the radiological assessments conducted by IAEA in cooperation with UNEP and WHO provide the basis for public reassurance in all of the countries concerned.